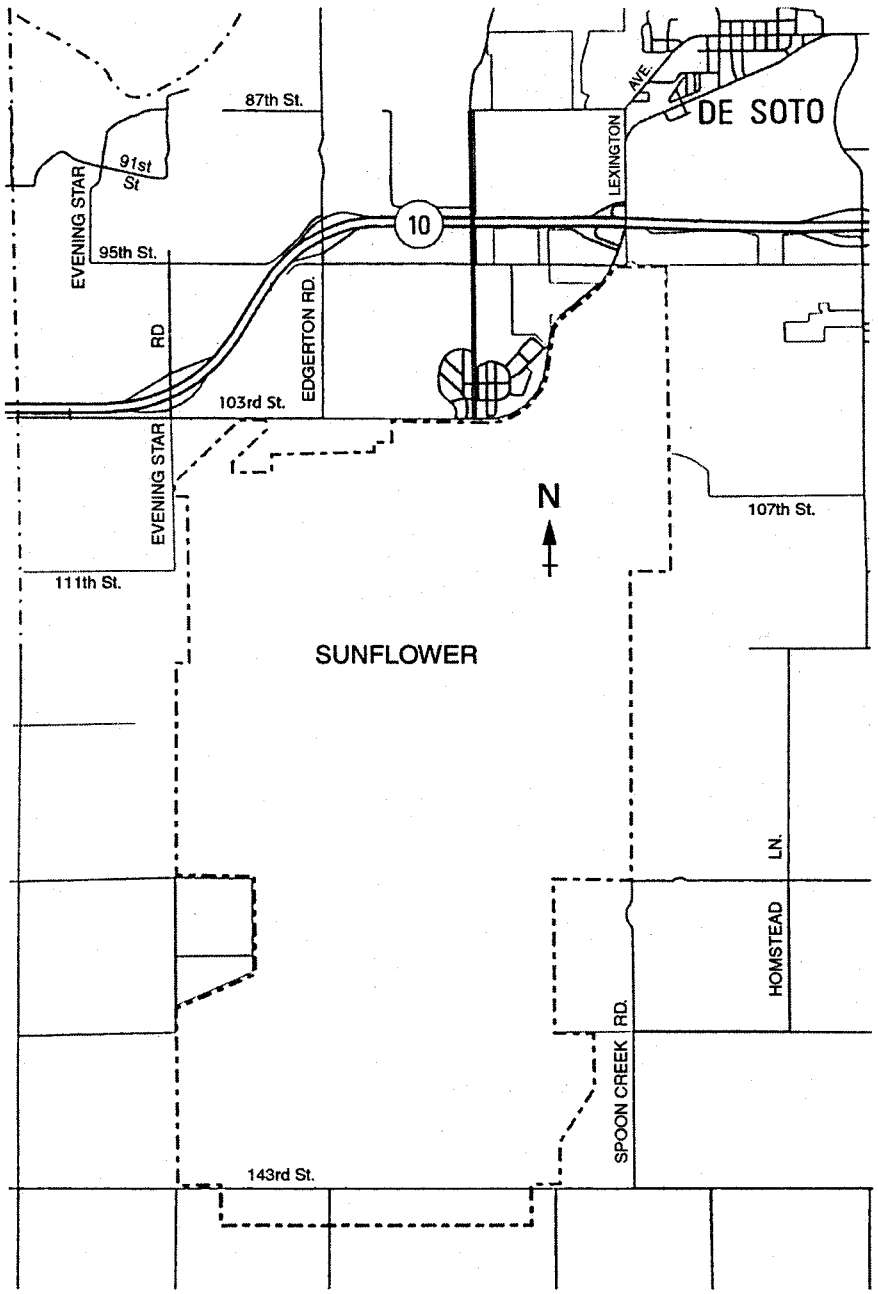


Not to scale

Source: Dames & Moore/BRW, January 1999 Louis Berger & Associates, Inc.

d. Local Circulation System and Site Access

Johnson County is one of the fastest growing areas in the Kansas City Metropolitan area. One of the high growth areas in the county is expected to be the K-10 corridor, and, as a result of this, there is a "K-10 Highway Corridor Area Plan" included in the *Johnson County Rural Comprehensive Plan*. The county is currently in the process of developing the "K-10 Highway Corridor Area Plan", as well as a *Comprehensive Arterial Road Network Plan*. These plans will provide the guidelines for the future roadway network in this area.

The only existing public entrance to Sunflower is located on 103rd Street, south of Clearview City. Lexington Road, Edgerton Road, and Evening Star Road connect 103rd Street to K-10. There are no public roads that pass through Sunflower. Edgerton Road and 143rd Street provide access to the southern end of Sunflower, although there are currently no public entrances to Sunflower from these roadways. Lexington Road, Edgerton Road, Evening Star Road, 103rd Street, and 143rd Street are paved two-lane, county-maintained roadways.

Average daily traffic (ADT) information for the existing local roadway system was obtained from the Kansas Department of Transportation (KDOT) and the Johnson County Public Works Department, and this ADT data is shown in Exhibit III-27.

EXHIBIT III-27
EXISTING AVERAGE DAILY TRAFFIC (ADT) VOLUMES

Location	ADT
K-10 (East of Lexington Avenue)	25,165
K-10 (East of Edgerton Road)	23,295
K-10 (East of Evening Star Road)	23,420
K-10 (West of Evening Star Road)	26,180
Lexington Ave. (North of K-10)	4,155
Lexington Ave. (South of K-10)	2,560
Lexington Ave. (South of 95th Street)	1,640
Edgerton Rd.(North of K-10)	870
Edgerton Rd. (North of 103rd Street)	110
Edgerton Rd. (South of 143rd Street)	275
Evening Star Rd. (North of K-10)	410
Evening Star Rd. (South of K-10)	560
Evening Star Rd. (South of 103rd Street)	150
103rd St. (East of Evening Star Road)	630
103rd St. (West of Evening Star Road)	550
143rd St. (East of Edgerton Road)	380
143rd St. (West of Edgerton Road)	475

Source: Traffic Count Map of Kansas City Metro Area, KDOT, Oct.,1998; 1994 traffic count data from Johnson County Public Works Department.

Manual turning movement counts were recorded for 15-minute intervals between 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM on December 8-9, 1998 at the following key intersections:

- K-10 Eastbound (EB) Ramps and Lexington Road
- K-10 Westbound (WB) Ramps and Lexington Road
- K-10 EB Ramps and Edgerton Road

- K-10 WB Ramps and Edgerton Road
- K-10 EB Ramps and Evening Star Road
- K-10 WB Ramps and Evening Star Road
- Lexington Road and 95th Street
- Edgerton Road and 103rd Street
- Edgerton Road and 143rd Street

The AM and PM peak hour traffic for the nine key intersections is shown in Exhibit III-28. The turning movement counts for the entire peak traffic periods for each intersection are provided in Appendix E.

Peak hour traffic operations for the key intersections were analyzed using the Highway Capacity Software (HCS), version 2.1e, developed by McTrans Center, University of Florida, Gainesville, Florida. The HCS is based on the methodologies set forth in Special Report 209, 1994 Highway Capacity Manual (HCM). The HCM describes the operating conditions for transportation facilities in terms of level of service (LOS). Six LOSs are defined using letter designations, with "A" representing the best operating conditions and "F" the worst operating conditions. A brief description of the operating conditions represented by each LOS is provided in Exhibit III-29.

The results of the level of service analysis for the nine key intersections are shown in Exhibit III-30. The existing AM and PM peak hour traffic was analyzed for each intersection. The Johnson County Public Works Department considers LOS "C" as the minimum acceptable LOS for traffic operations at intersections. All of the key intersections are currently operating at acceptable levels of service for both the AM and PM peak traffic periods.

e. Accident Data

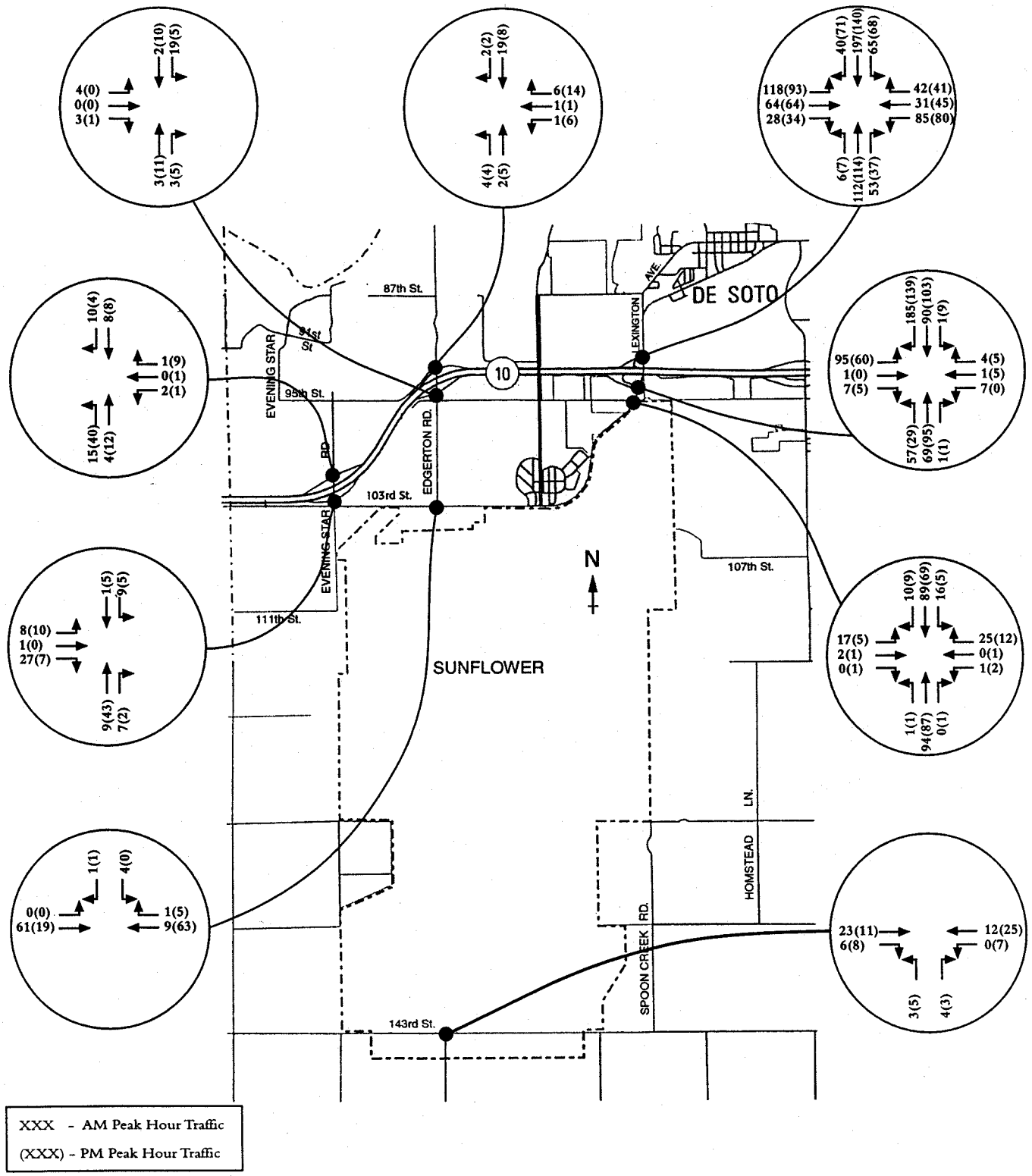
Accident data for the nine key intersections for the period 1993 through 1997 was obtained from the Bureau of Transportation Planning of KDOT. A total of five accidents occurred at the nine key intersections during the five-year study period. Five of the intersections showed no reported accidents; three had one accident; and one intersection had two accidents. These are very low accident frequencies and indicate that none of the key intersections are currently experiencing safety problems.

7. Meteorology

The climate of Johnson County is a typical continental type characterized by wide daily and annual variations in temperature. There are no natural topographic obstructions to prevent free seep of air from all directions. The influx of moist air from the Gulf of Mexico, and dry air from the semi-arid regions of the southwest, determine whether wet or dry conditions prevail. There is often conflict between the warm moist gulf air and the cold polar continental air from the north of this area. Winters are cold, with prevailing winter conditions from December to February. January is the coldest month. In winter the average temperature is 32.3 degrees Fahrenheit (°F), and the average daily minimum is 22.5°F. The summer season is characterized by warm days and mild nights, with moderate humidities. Warm temperatures of summer last for about six months every year, and the transition seasons of spring and fall are relatively short. In summer the average temperature is 76.0°F, and the average daily maximum is 86.5°F. July is the warmest month. Precipitation is heaviest in late spring and early summer. The average annual precipitation is 38.52 inches. The average annual snowfall is 19.0 inches. In an average year, 22 days have at least one inch of snow on the ground, but it is unusual for the snow cover to last over seven consecutive days. The distribution of measurable snow normally extends from November to April.

1998 WEEKDAY AM AND PM PEAK HOUR TRAFFIC VOLUMES

EXHIBIT III-28



Source: Dames & Moore/BRW, December 1998

Louis Berger & Associates, Inc.

EXHIBIT III-29
DESCRIPTION OF LEVELS OF SERVICE

Level of Service	Description
A	Traffic moves freely. The free-flow condition is accompanied by low volumes. All waiting vehicles clear on one green phase at signalized intersections. The major movements have a low percentage of stops (average delay per vehicle ≤ 5 seconds).
B	Traffic moves fairly freely. Volumes are still somewhat low. Waiting vehicles will still probably clear on one green phase at signalized intersections. Traffic on this major movement can expect less than a 50 percent chance of stopping (average delay per vehicle ≤ 15 seconds).
C	Traffic moves smoothly. Volumes beginning to increase. Some minor movements may not clear on one green phase at signalized intersections. Traffic on the major movement can expect a 50 percent chance of stopping (average delay per vehicle ≤ 25 seconds).
D	Traffic approaching unstable flow. Acceptable intersection operation for peak periods in urban areas. Many intersection movements may not clear on one green phase at signalized intersections. Traffic on the major movement can expect a greater than 50 percent chance of stopping (average delay per vehicle ≤ 40 seconds).
E	Unstable traffic flow. Volumes are at or near capacity. No vehicles are able to go through the intersection without having to stop (average delay per vehicle ≤ 60 seconds).
F	Saturation condition. Volumes are over capacity. All vehicles will stop and will probably require more than one green phase at signalized intersections (average delay per vehicle > 60 seconds).

Source: *Highway Capacity Manual*, 1994.

The greatest snowfall, 82.1 inches, occurred during the winter of 1911-12. The prevailing wind is from the south. The average annual wind speed is 10 miles per hour. The highest monthly average wind speed occurring in March, is 12 miles per hour. Tornadoes and severe thunderstorms occur occasionally in Johnson County. These storms are usually local and short-lived. Hail which is infrequent and of local nature, occurs during the warmer part of the year (Exhibit III-31).

8. Air Quality

a. Definitions and Standards

The U.S. Environmental Protection Agency (EPA) has defined ambient air as "that portion of the atmosphere, external to buildings, to which the general public has access.[1]" The EPA has also identified six major air pollutants that are defined as criteria pollutants. These criteria air pollutants are as follows: (1) Carbon monoxide (CO); (2) Oxides of nitrogen (NO_x); (3) Sulfur dioxide (SO_2); (4) Particulate matter less than 10 microns in diameter (PM_{10}); (5) Ozone (O_3); and (6) Lead. Exhibit III-32 provides basic origin information as well as physical and chemical characteristics of these pollutants.

In compliance with the 1970 Clean Air Act (CAA) and the 1990 Amendments (CAAA), the EPA has developed National Ambient Air Quality Standards (NAAQS) for the protection of the public health and welfare with the allowance of an adequate margin of safety. Two types of NAAQS were established: primary and secondary standards. Primary standards set limits to protect the public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set

[1] 40 CFR, Part 50.

EXHIBIT III-30
LEVEL OF SERVICE (LOS) ANALYSIS: EXISTING CONDITIONS
1998 WEEKDAY AM AND PM PEAK HOUR TRAFFIC

Location	AM Peak Hour LOS	PM Peak Hour LOS
K-10 WB Ramps & Lexington Avenue:		
EB approach	C	B
WB approach	B	B
NB left turn	A	A
SB left turn	A	A
K-10 EB Ramps & Lexington Avenue:		
EB approach	B	B
WB approach	A	A
NB left turn	A	A
SB left turn	A	A
K-10 WB Ramp & Edgerton Road:		
WB approach	A	A
NB left turn	A	A
K-10 EB Ramp & Edgerton Road:		
EB approach	A	A
SB left turn	A	A
K-10 WB Ramp & Evening Star Road:		
WB approach	A	A
NB left turn	A	A
K-10 EB Ramp & Evening Star Road:		
EB approach	A	A
SB left turn	A	A
Lexington Avenue & 95th Street:		
EB approach	A	A
WB approach	A	A
NB left turn	A	A
SB left turn	A	A
Edgerton Road & 103rd Street:		
SB approach	A	A
EB left turn	A	A
Edgerton Road & 143rd Street:		
NB approach	A	A
WB left turn	A	A

Source: Dames & Moore/BRW, Inc., December 1998.

EXHIBIT III-31
TEMPERATURE, PRECIPITATION, AND WIND

Month	Temperature (°F)			Precipitation (inches)			Wind	
	Average Daily Maximum	Average Daily Minimum	Average	Average	Mean Number of Days with 0.01 Inches or More	Maximum Monthly Snow, Ice Pellets, Hail in Inches (Year)	Average Speed (mph)	Resultant Direction [b]
January	34.5	17.2	25.9	1.08	7.2	14.2 (1977)	11.5	SW
February	41.1	23.0	32.1	1.19	6.9	12.7 (1982)	11.4	NW
March	51.3	31.7	41.5	2.41	10.4	11.4 (1978)	12.7	SW
April	65.1	44.4	54.8	3.23	10.5	7.2 (1983)	12.4	SW
May	74.6	54.6	64.6	4.42	11.4	T [a] (1990)	10.4	SE
June	83.3	63.8	73.6	4.66	10.1	T (1989)	9.9	SE
July	88.5	68.5	78.5	4.35	8.1	T (1992)	9.4	S
August	86.8	66.5	76.7	3.57	8.8	0	9.1	SE
September	78.6	58.1	68.4	4.14	8.3	T (1992)	9.6	SE
October	67.9	47.0	57.5	3.10	7.6	T (1992)	10.6	S
November	52.1	34.0	43.1	1.63	8.1	7.1 (1975)	11.5	NW
December	40.1	23.7	31.9	1.38	7.8	13.2 (1983)	11.3	SW
Year	63.7	44.4	54.1	35.16	105.0	14.2 (Jan. 1992)	10.8	S

[a] T = trace amount.

[b] Direction from which the wind is blowing, data for 1992. S-south; SW-southwest; SE-southeast; NW-northwest.

Source: National Oceanic and Atmospheric Administration, Local Climatological Data, Annual Summaries for 1992, Part III–Central Region, Meteorological data recorder at International Airport, Kansas City, Missouri; average data based on the 30-year record period between 1951 and 1980; extremes are based on most recent occurrence.

limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. On July 18, 1997 the EPA issued new, more stringent NAAQS for particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$) and O_3. The revised NAAQS, based on studies linking particulate matter (PM) and O_3 concentrations to adverse health and welfare effects at levels allowed by the previous PM and O_3 standards, became effective on September 16, 1997. On May 14, 1999, the U.S.

EXHIBIT III-32
DESCRIPTION OF CRITERIA POLLUTANTS

Criteria Pollutant	Description
Carbon Monoxide (CO)	A colorless, odorless, tasteless, and poisonous gas. CO is formed through incomplete combustion of carbon in fuels (i.e., crude oil, fuel oil, natural gas, wood waste, gasoline, and diesel fuel). Most combustion processes produce a small quantity of this gas. The major source of CO emissions is transportation (77% nationwide). When CO enters the bloodstream, it reduces the delivery of oxygen to the body organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks.
Nitrogen Oxides (NO_x)	During combustion, nitrogen (N) combines with oxygen (O) to form nitric oxide (NO). NO combines with more oxygen to form nitrogen dioxide (NO_2). NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. Nitrogen oxides (NO_x) are an important precursor both to ozone (O_3) and acid rain. Under intense sunlight, NO_2 reacts with organic compounds to form photochemical oxidants. Oxidants are gaseous air pollutants that are not emitted into the air directly. They are formed through a complex chemical reaction that involves a mixture of NO_x and reactive hydrocarbons in the presence of sunlight. Two major sources of NO_x are transportation and stationary fuel combustion such as electric utility and industrial boilers. NO_x can irritate lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.
Sulfur Dioxide (SO_2)	A toxic, colorless gas with a distinct odor. Oxides of sulfur in the presence of water vapor, such as fog, may result in the formation of sulfuric acid mist (H_2SO_4). Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters. High concentrations of SO_2 affect breathing and may aggravate existing respiratory and cardiovascular disease.
Particulate Matter (PM_{10})	Micron and submicron particles that assume characteristics of a gas and remain suspended in the atmosphere for long periods of time. Particulate matter includes dust, dirt, soot, smoke, and liquid droplets. Until recently, particulate pollution had been measured in terms of total suspended particulates (TSP). These standards have been replaced with revised measurements of particulate matter under 10 microns in diameter (PM_{10}) (FR 24633, July 1, 1987). Particulate matter is emitted by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust. High concentrations of particulate matter have adverse effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alternations in the body's defense system against foreign materials, damage to lung tissue, carcinogenesis, and premature death.

EXHIBIT III-32 (CONTINUED)
DESCRIPTION OF CRITERIA POLLUTANTS

Criteria Pollutant	Description
Ozone (O_3)	An oxidant that has received a great deal of publicity and is one of the largest components of urban smog. While O_3 in the upper atmosphere is formed naturally and it is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O_3 at ground level, created by a combination of ozone precursors and sunlight, are a major health and environmental concern. O_3 precursors are hydrocarbons, also known as volatile organic compounds (VOCs) and nitrogen oxides (NO_x). Peak O_3 levels occur typically during the warmer times of the year, because the chemical reactions associated with O_3 formation are stimulated by sunlight and temperature. Transportation and industrial sources are major sources of O_3 precursors. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, pains shops, and other sources using solvents. The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function and sensitizes the lung to other irritants.
Lead (Pb)	Ambient lead (Pb) in the atmosphere has decreased dramatically in recent years. The EPA estimates a drop of 70 percent since 1975, largely due to the increasing use of unleaded gasoline in mobile sources (e.g., automobiles). Pb gasoline additives, non-ferrous smelters, and battery plants are the most significant contributors to atmospheric Pb emissions. Excessive Pb exposure can cause seizures, mental retardation, and/or behavioral disorders.

Source: The EPA Internet website: //www.epa.gov/airprogm/oar/oaqps/greenbk.

Court of Appeals for the District of Columbia Circuit, determined that the new 8 hour ozone standard cannot be enforced, and remanded the cases to EPA for further consideration of all the standards at issue including the new PM2.5 standard. On June 28, 1999, the Department of Justice filed a petition for rehearing. Exhibit III-33 presents the currently applicable standards.

The EPA classifies each county as being in "attainment" or "nonattainment" with respect to each criteria pollutant. The EPA defines an attainment area as an area that has air quality as good as, or better than, the NAAQS for all of the criteria pollutants. In a nonattainment area, the air quality does not meet one or more of the NAAQS. The EPA has also defined a "maintenance area" as a third category of air quality. A maintenance area is an area that the EPA formerly classified as a nonattainment area; however, because of air quality improvements, the EPA reclassified the area as an attainment area. The EPA bases its attainment status designations on the results of ongoing air monitoring studies and the number of exceedances of the NAAQS for specific criteria pollutants.

For some criteria pollutants (i.e., O_3, CO, and PM_{10}), the EPA has further classified nonattainment areas according to the degree of nonattainment, depending on how much the monitored concentrations exceed their respective NAAQS. The EPA defined these nonattainment area classifications in terms of the quantitative monitoring results. Exhibit III-34 identifies and defines these nonattainment area classifications for these three criteria pollutants.

EXHIBIT III-33
NAAQS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	NAAQS		Standard Type
		ppm [a]	g/m^{3} [b]	
Particulate Matter Less than 10 microns in Diameter (PM_{10})	Annual	N/A [c]	50	Primary and Secondary
	24-hour	N/A	150	Primary and Secondary
Sulfur Dioxide (SO_2)	Annual	0.03	80	Primary
	24-hour	0.14 [e]	365 [e]	Primary
	3-hour	0.5	1,300	Secondary
Nitrogen Dioxide (NO_2)	Annual	0.053	100	Primary and Secondary
Ozone (O_3)	1-hour	0.12 [d]	235 [d]	Primary and Secondary
Carbon Monoxide (CO)	8-hour	9 [d]	10,000 [d]	Primary
	1-hour	35 [d]	40,000 [d]	Primary
Lead (Pb)	Calendar	N/A	1.5	Primary and Secondary

[a] Concentrations of criteria pollutant in ambient air in parts per million.
[b] Measured in micrograms per cubic meter.
[c] N/A = not applicable
[d] Measured concentration is not to exceed NAAQS more than once per year.

Note: On May 14, 1999, the U.S. Court of Appeals of the District of Columbia determined that the new 8 hour ozone standard cannot be enforced, and remanded the cases to EPA for further consideration of all the standards at issue including the new PM2.5 standard. On June 28, 1999, the Department of Justice filed a petition for rehearing. As a result of the court's decision, only those standards currently applicable are presented in this exhibit.

Source: 40 CFR Part 81 (Air Quality Designations and Classifications, Final Rule).

The EPA developed the Pollutant Standards Index (PSI) to provide accurate, timely, and easily understandable information about daily levels of air pollution. The PSI enables the public to determine whether air pollution levels in a particular location are good, moderate, unhealthful, or hazardous. The EPA uses the PSI to measure five pollutants: PM, SO_2, CO, NO_2, and O_3. The PSI converts the measured pollutant concentration in ambient air to a number on a scale of 0 to 500. Exhibit III-35 presents the PSI intervals and associated air quality description, health effects, and cautionary statements.